EAST BIRCH CREEK AQUATIC ECOSYSTEM RESTORATION PROJECT – EVALUATION OF AFTER CONSTRUCTION PERFORMANCE

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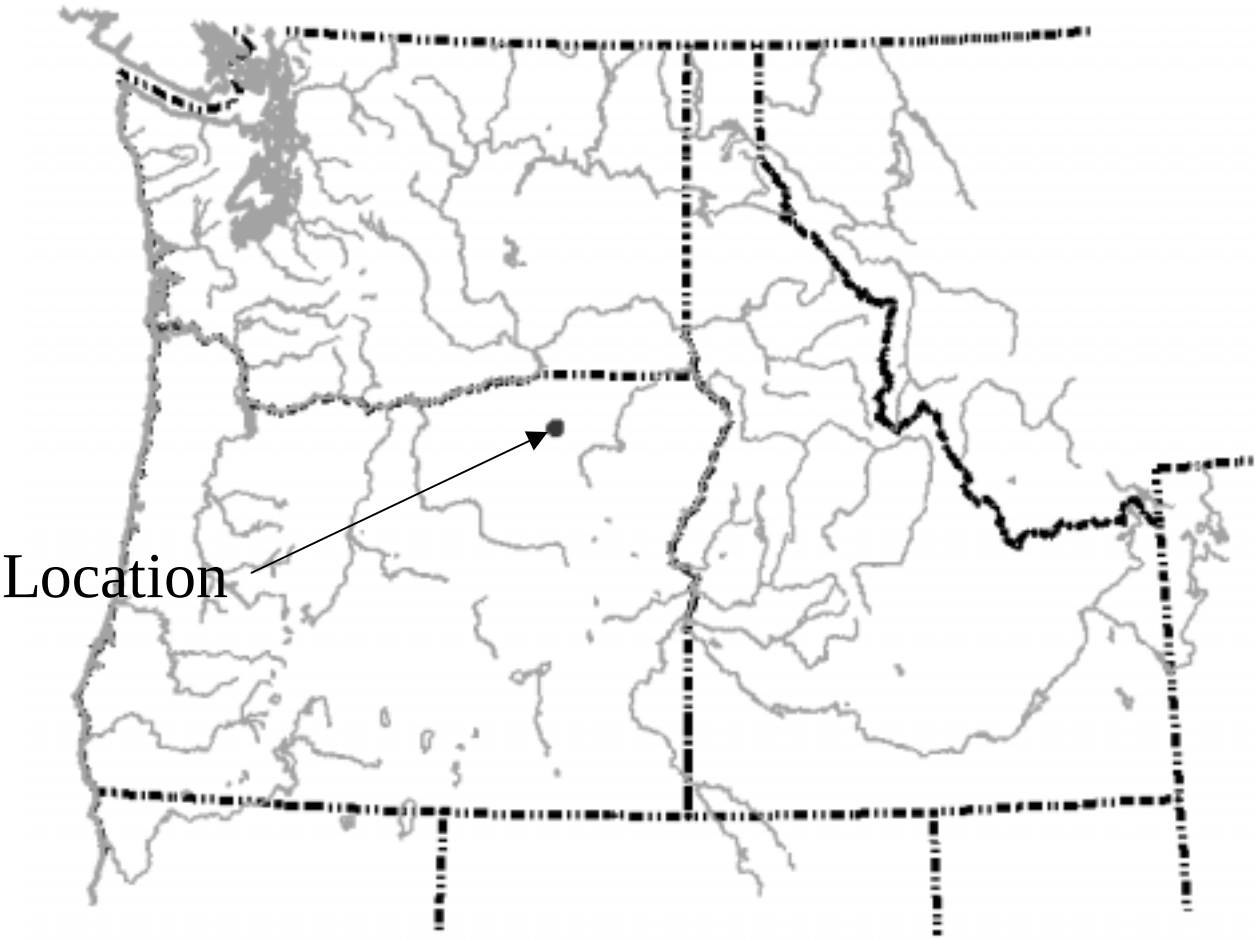
Corps of Engineers

PROJECT LOCATION

Walla Walla District



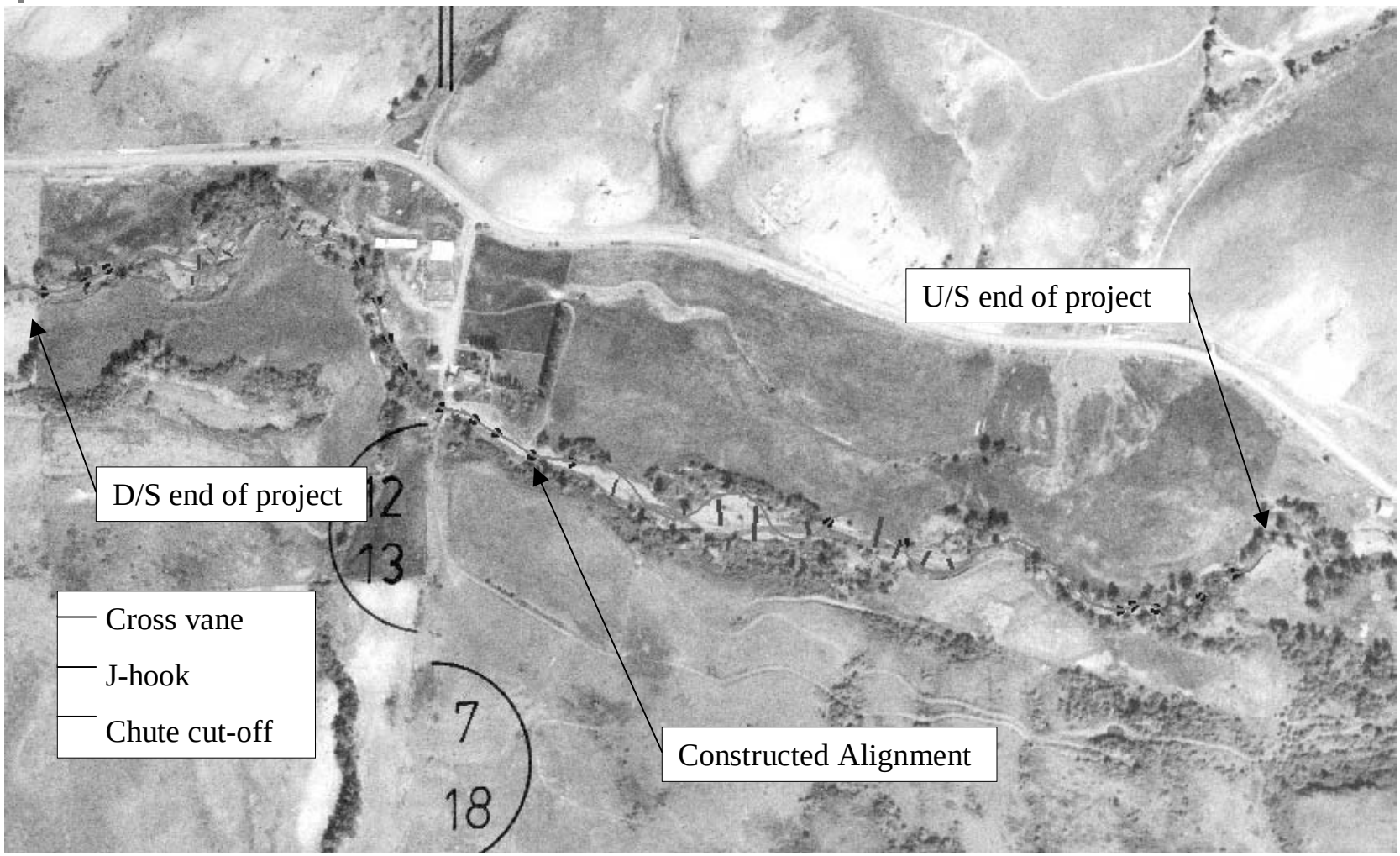
PROJECT BACKGROUND

- Section 206 project with Oregon Department of Fish and Wildlife
- Languished for more than a year with no progress on feasibility study
- Sponsor issued ultimatum do the following or quit project
  - Construction by next summer
  - Rosgen type design
  - Meander pattern
- feasibility study started in earnest in August 2000
- Construction began on October 8 2001
- Bankfull event April 14, 2002

Project Details

- 1-mile in length
- Rosgen based design
- Totally new alignment for 1,300 ft reach to create meandering alignment and new section throughout
- 18 cross vanes and 48 J-hooks used
- Time and materials type of construction contract also was an 8(a) contract
- Some HEC modeling for floodplain management

DESIGN ALIGNMENT



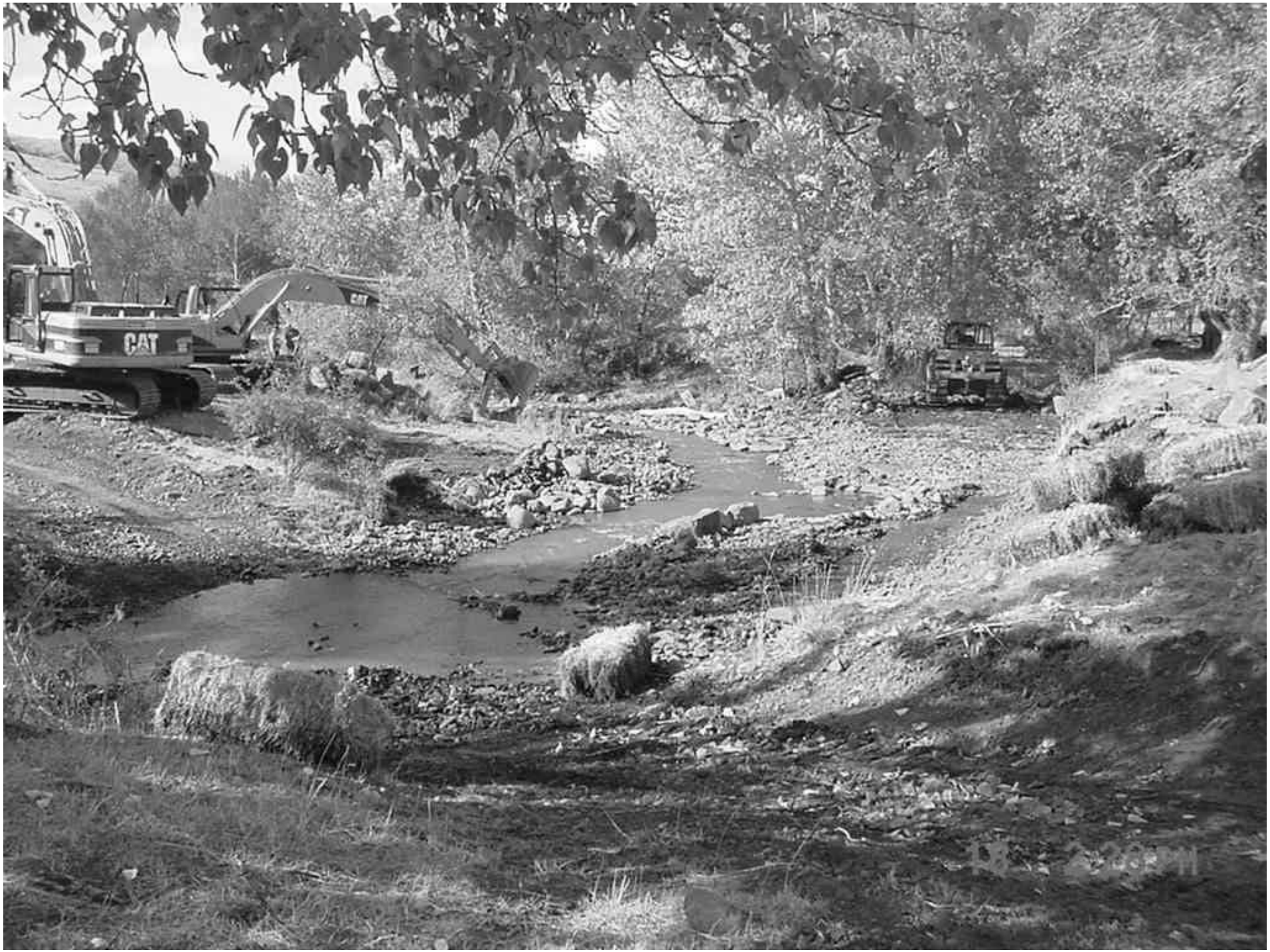
TYPICAL CROSS VANE

Objectives (Risk Metrics)

- Reduce width and increase depth
- Reduce water temperatures
- Reconnect floodplain & establish riparian zone
- Increase riffles and pools
- Stabilize channel

Reduce Width & Increase Depth

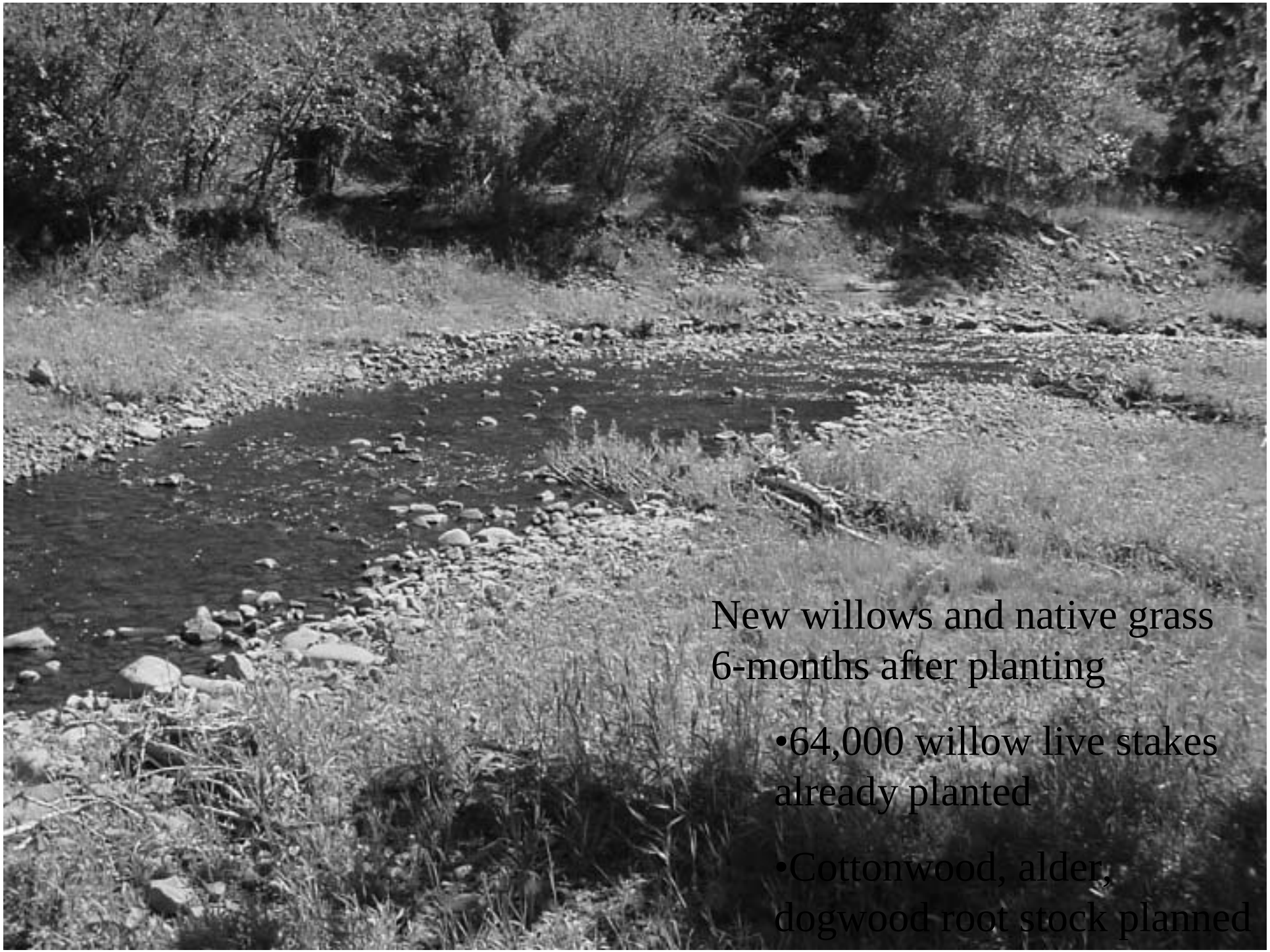
- Prior to Restoration
  - Wide and flat bottomed
  - 28 – 76 ft bankfull width with average of 39 ft
- After Construction
  - Average bankfull width 28 ft.
  - Late summer flows consolidated into 10 ft wide low flow channel


CAT

Water Temperature Reduction

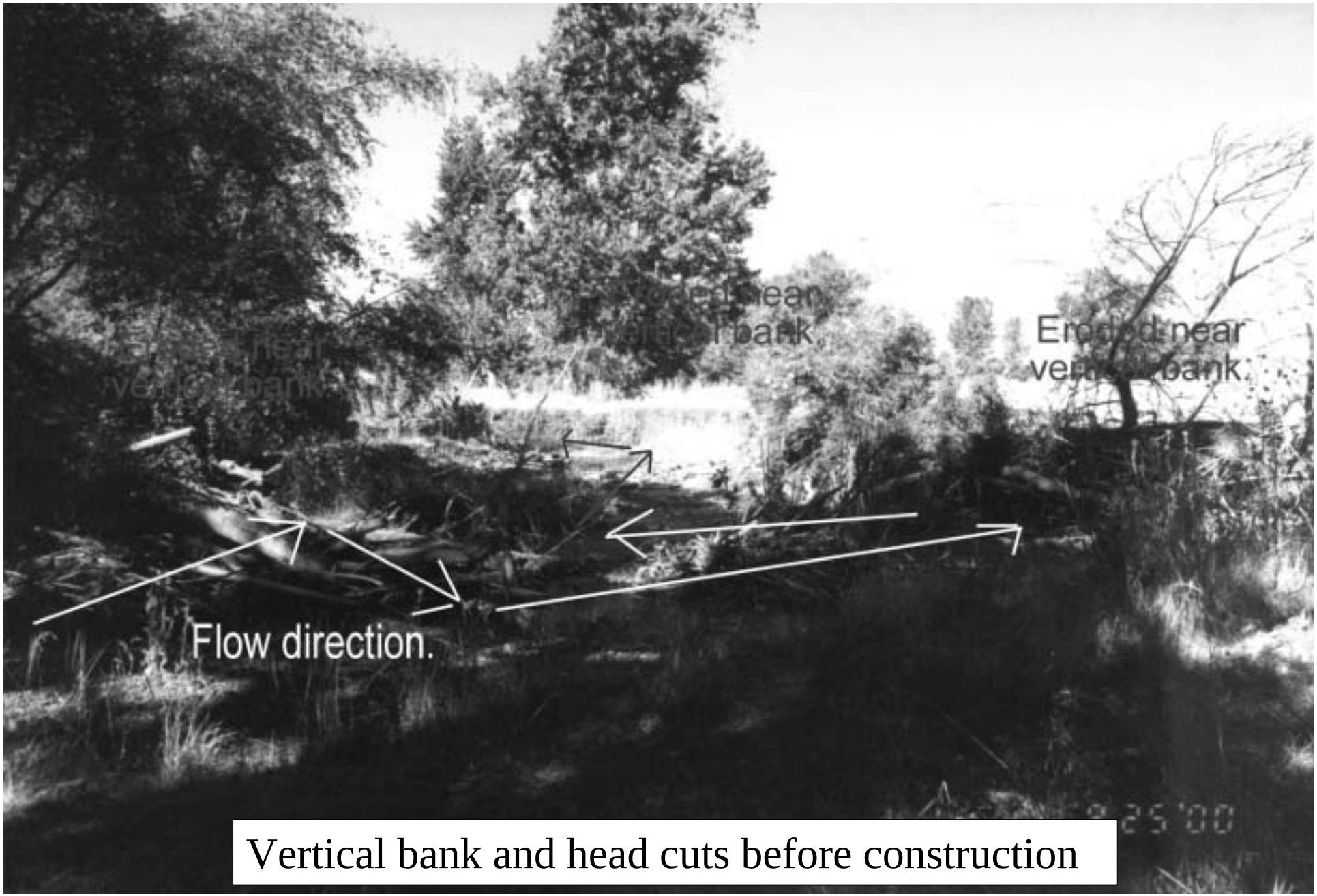
- Short term
  - Consolidated low flows
- Long term
  - Establish canopy over channel
  - Wide riparian zone with shaded flood plane area

Reconnect Floodplain / Establish Riparian Zone


New willows and native grass
6-months after planting
•64,000 willow live stakes
already planted
•Cottonwood, alder,
dogwood root stock planned

Increase Riffles & Pools/Stabilize Channel

- 84% of cross vanes and J-hooks performed well
- 16% performed poorly resulting in bank erosion, sediment deposition blocking channel, sediment filling pools, and over bank flows when flow should have been contained in-channel
  - Problems more obvious in C type channel reach
- Aggradation occurring at one of the meanders

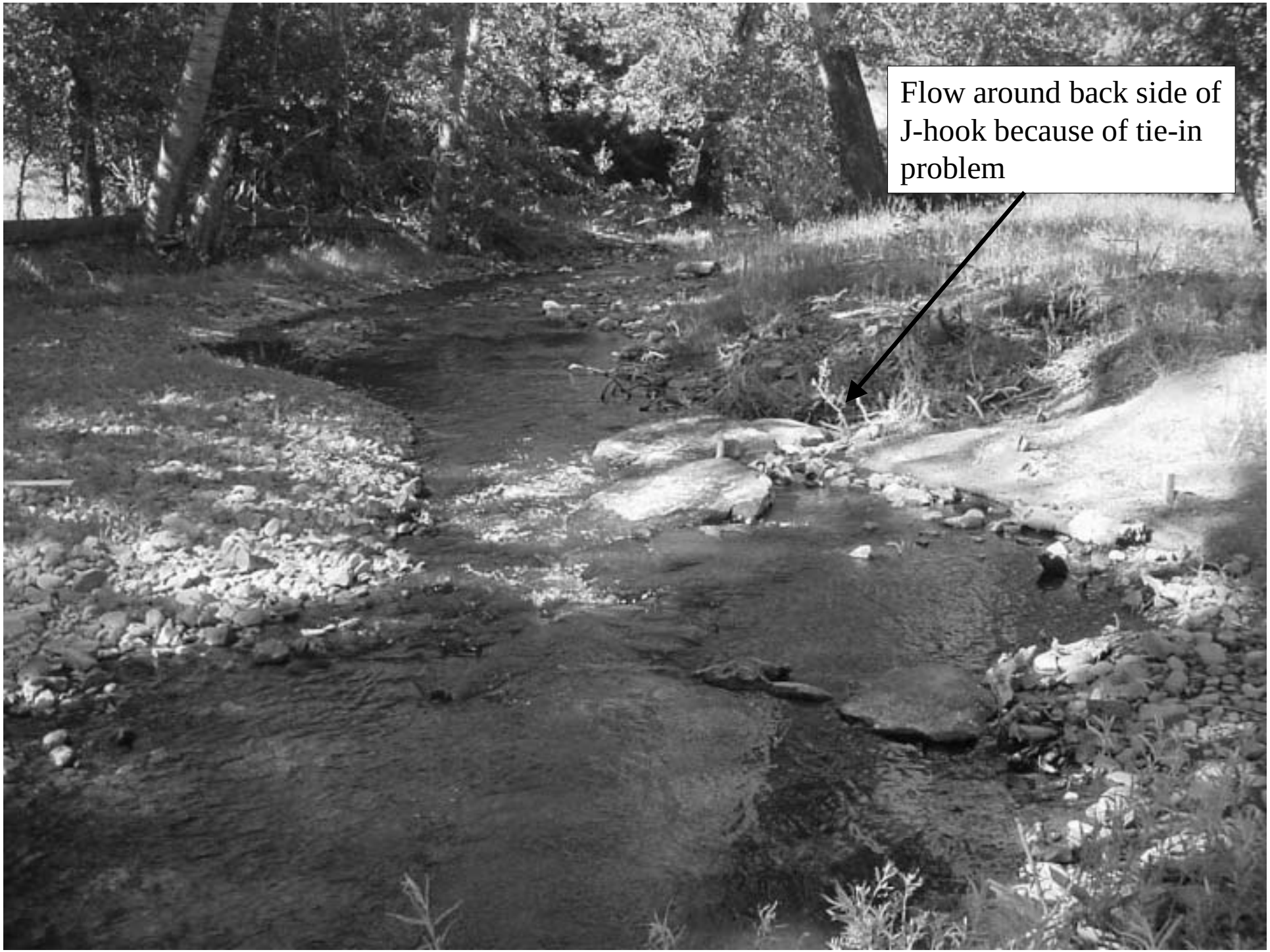


Vertical bank and head cuts before construction

Vertical bank and head cuts before construction


Same area after construction

Cross vanes maintained channel stability and provides deep pool


Flow around back side of J-hook because of tie-in problem

After Construction Performance

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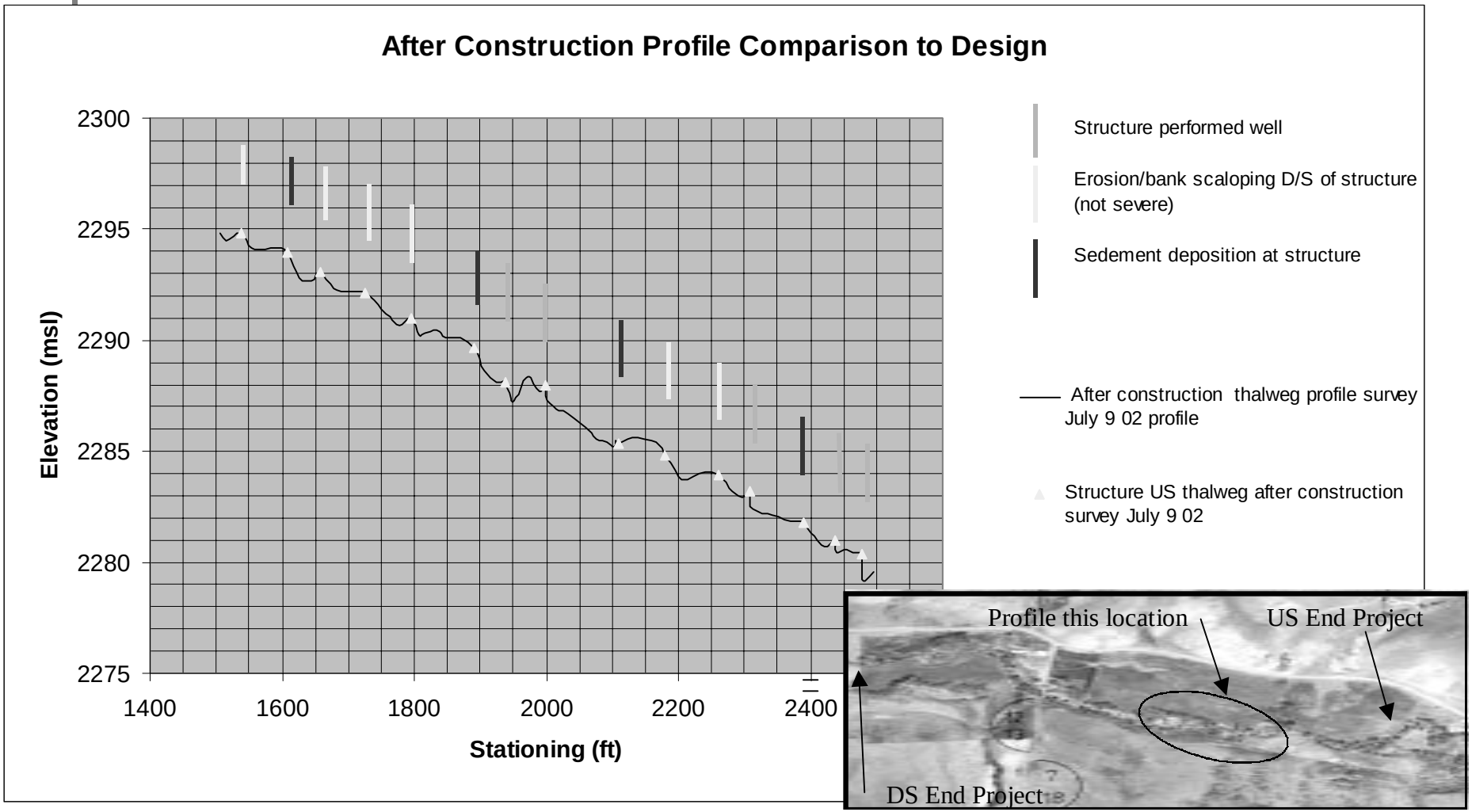

Profile for Thalweg

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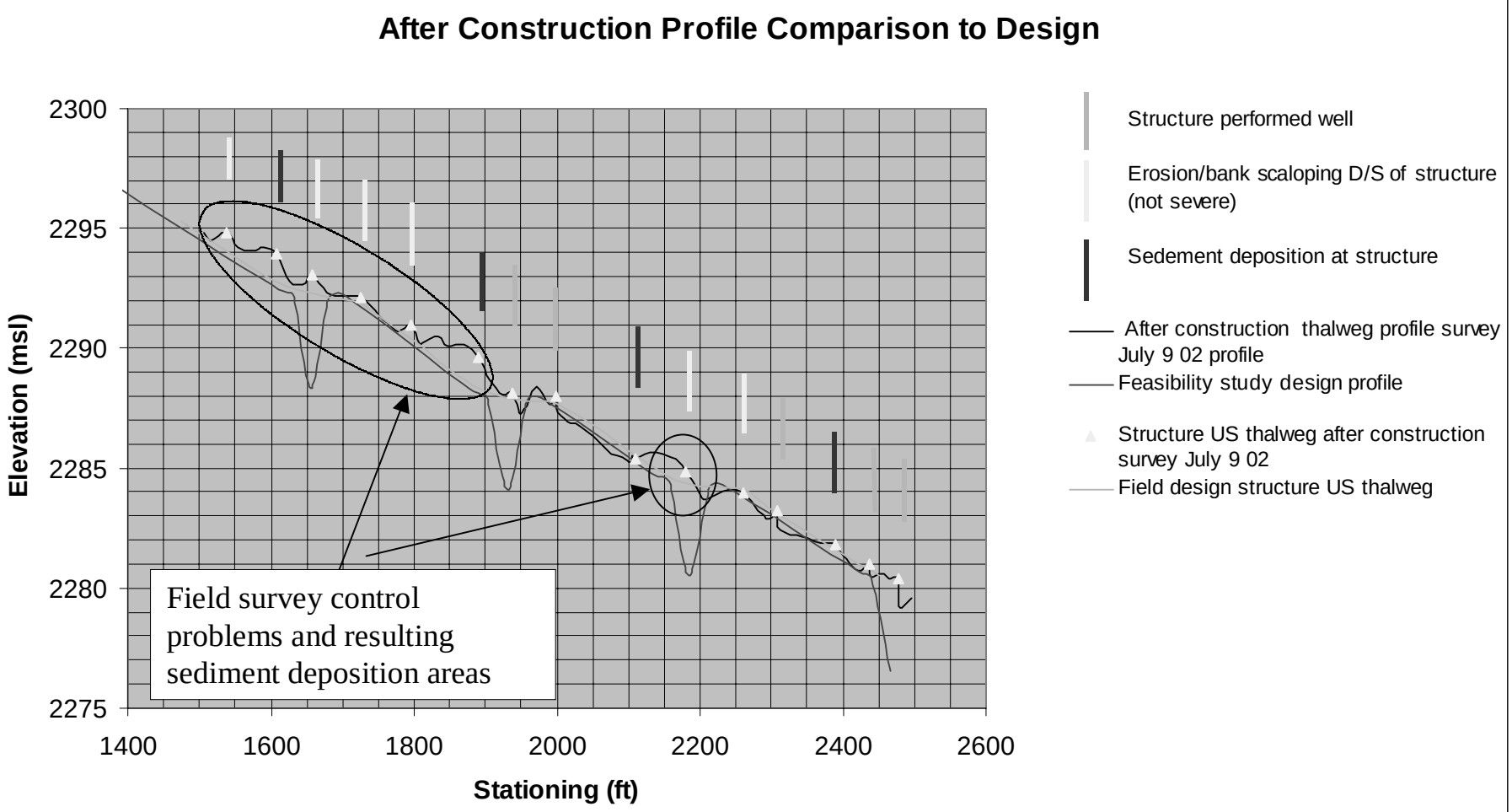

Profile for Bankfull

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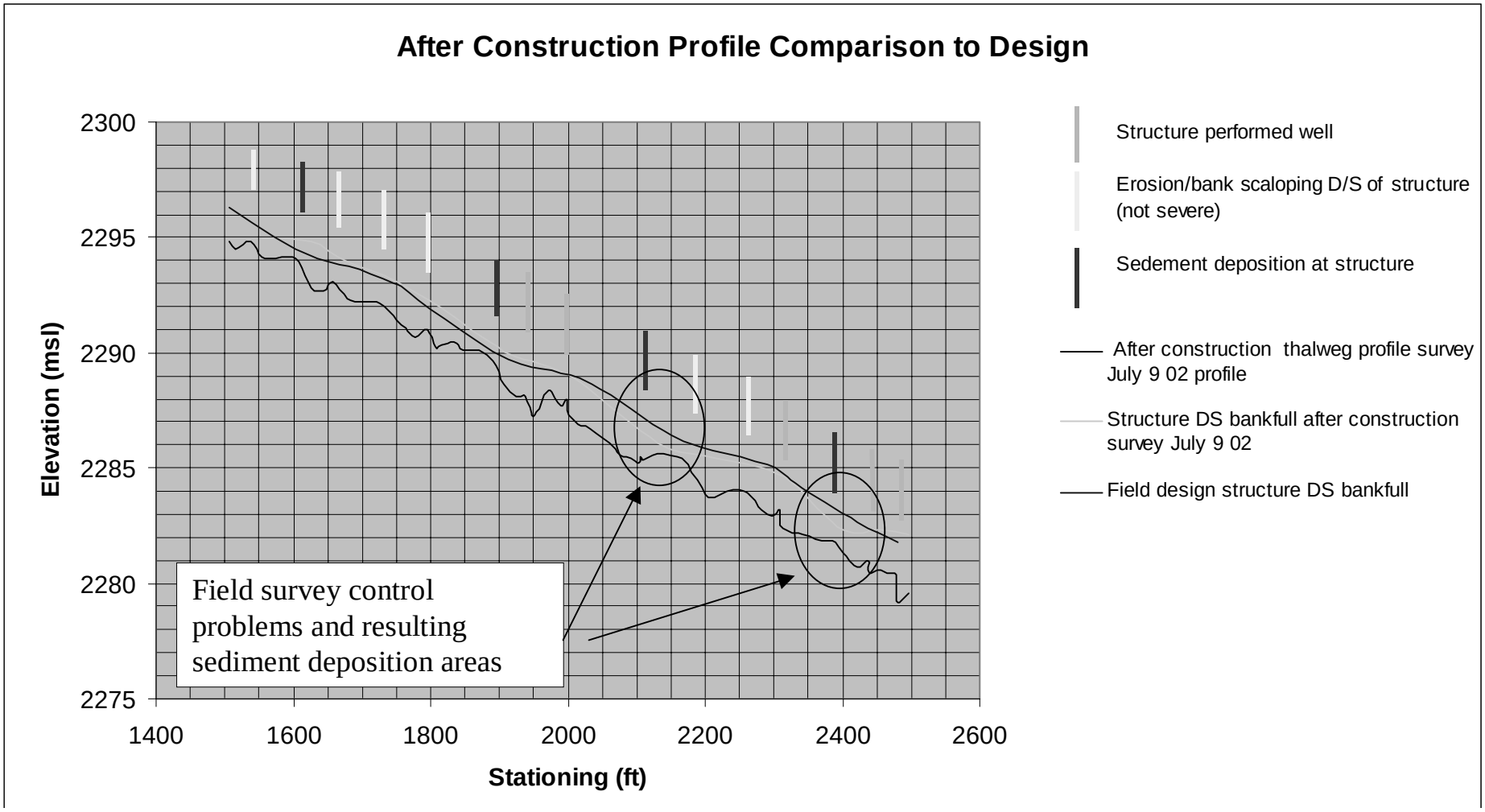

Construction of cross vane

- Trying to work stone down to design elevation (note is too high)
- Surveyed surface often underwater in poor visibility conditions

Water Surface Profile

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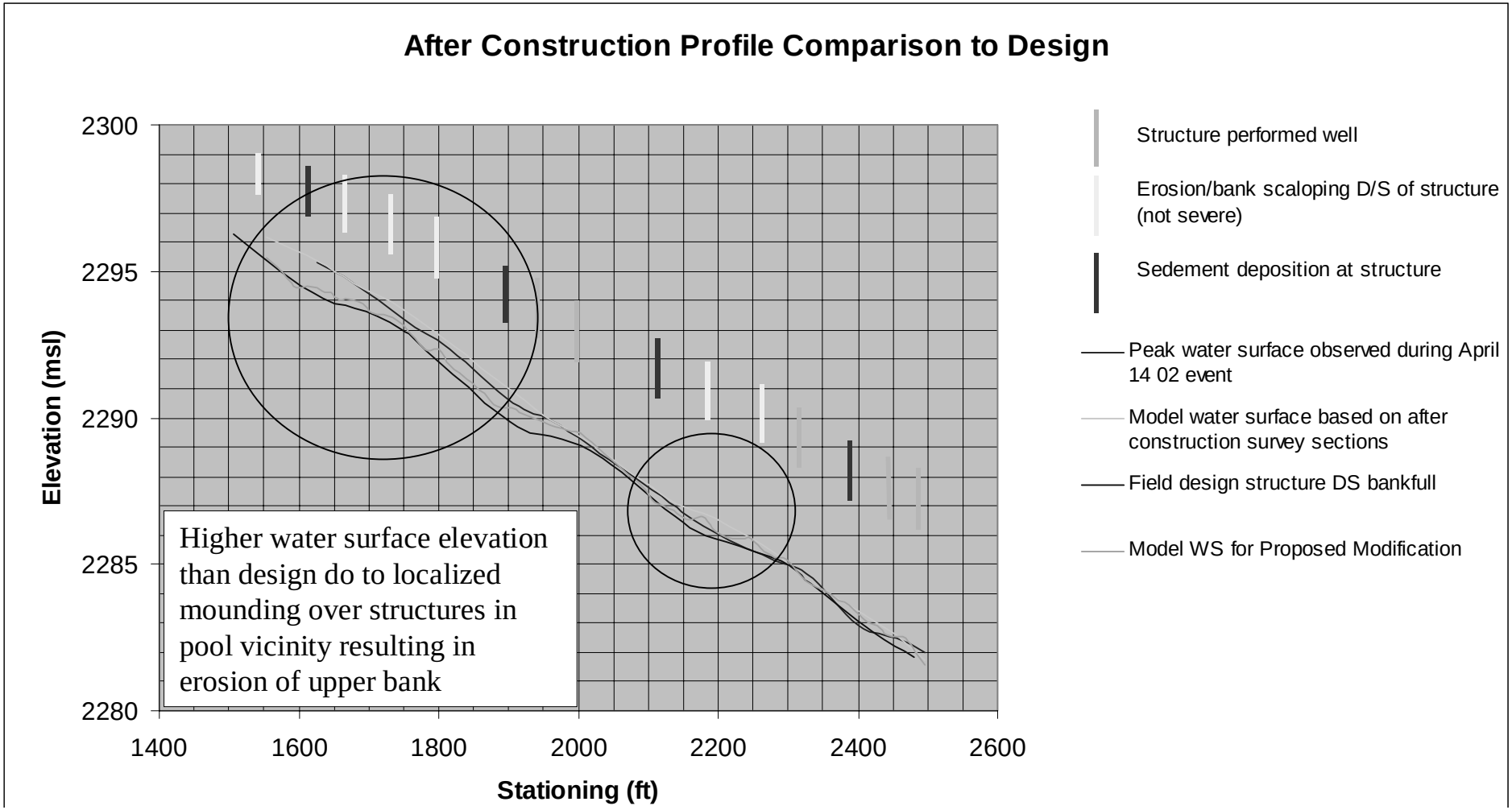

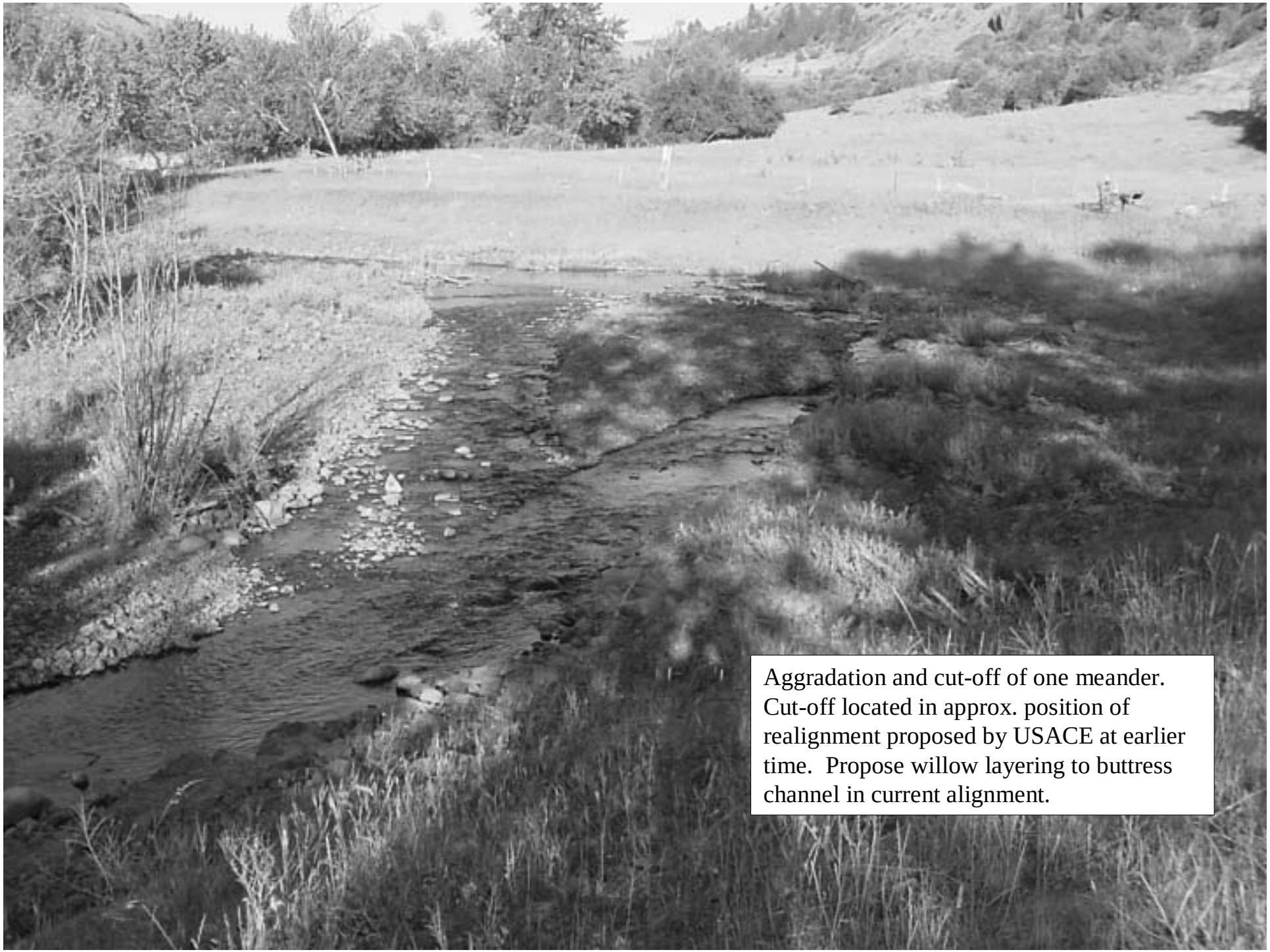

Aggradation and cut-off of one meander. Cut-off located in approx. position of realignment proposed by USACE at earlier time. Propose willow layering to buttress channel in current alignment.

Conclusions

- Project is overall successful, but not yet tested for events larger than bankfull
- For the areas that do show problems, primary risk stems from the type of construction contract and level of QA/QC
  - Pool depth and channel stability threatened by survey control problems during construction
  - Conventional construction contract not acceptable in this case (time and materials contract vs. no project)
  - Cost to fix survey control problems estimated at approximately $30k
- Moderate erosion in some areas may have been avoided by considering modeled water surface
- Anticipate fixing errors for minor cost and achieving objectives for pool depth and channel stability